

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte CHUN SHIAH

Appeal 2007-1647
Application 10/631,841
Technology Center 2800

Decided: October 24, 2007

Before JOSEPH L. DIXON, MAHSHID D. SAADAT, and
ST. JOHN COURTENAY III, *Administrative Patent Judges*.

COURTENAY, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the Examiner's rejection of claims 1-42. We have jurisdiction under 35 U.S.C. § 6(b). We REVERSE.

THE INVENTION

The disclosed invention relates generally to an interface circuit, and more particularly, to a low jitter input buffer (Specification 1).

Independent claim 1 is illustrative:

1. An input buffer receiver comprising:
 - a buffer input portion for receiving an input signal, said buffer input portion comprising a bias node;
 - a large capacitor coupled between the bias node and a lower supply voltage for providing a coupling ratio between a capacitance value of said large capacitor and a capacitance value of a parasitic capacitor coupled between said bias node and a ground reference point is approximately equal to a unity value such that a biasing voltage at said biasing node follows said lower supply voltage to minimize effects of a ground noise signal between the lower supply voltage and the ground reference point; and
 - a buffer output portion in communication with the buffer input portion for producing an output signal.

THE REFERENCES

Applicant's Admitted Prior Art (AAPA), *see* Fig. 1, labeled "FIG. 1 — Prior Art," *see also* pages 61-62, paragraphs 0014-0016.

Rapp US 6,373,328 B2 Apr. 16, 2002

THE REJECTIONS

Claims 1-42 stand rejected under 35 U.S.C. § 112, first paragraph, for failing to comply with the written description requirement.¹

¹ We note that the Examiner also objected, under 35 U.S.C. § 132(a), to the amendments filed on Jan. 14, 2005 and June 9, 2005 because the

Claims 1-42 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-42 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the teachings of AAPA in view of Rapp.

Rather than repeat the arguments of Appellant or the Examiner, we make reference to the Brief and the Answer for the respective details thereof.

ANALYSIS

35 U.S.C. § 112, first paragraph

We consider first the Examiner's rejection of claims 1-42 as failing to comply with the written description requirement under 35 U.S.C. § 112, first paragraph. Specifically, the Examiner concludes that the following claim language is unsupported by the original Specification, filed July 31, 2003 (Answer 4 and 8):

a coupling ratio between a capacitance value of said large capacitor and a capacitance value of a parasitic capacitor coupled between said bias node and a ground reference point is approximately equal to a unity value such that a biasing voltage at said biasing node follows said lower supply voltage to minimize effects of a ground noise signal between the lower supply voltage and the ground reference point.

amendments allegedly introduce new matter into the disclosure (Answer 3). Appellant asks us to review the Examiner's objection to the amendment (Br. 12-14). However, this is a petitionable, rather than appealable, matter, and we express no opinion as to its propriety. See 37 C.F.R. § 1.181.

(Independent claims 1, 12, 23, and 33).

The Appellant disagrees. Appellant contends that the concept of a coupling ratio is not new in the art. Appellant asserts that the coupling ratio of the instant invention approaches a maximum value of unity (1) as the magnitude of the capacitance of the large capacitor (C_{HC}) increases relative to the capacitance of the parasitic capacitor (C_p). Thus, Appellant contends that an artisan would clearly recognize a large coupling value as any value that approached unity (1) (Br. 16).

The Examiner agrees with Appellant that the coupling ratio is easily derived as $CR = C_{HC}/(C_{HC} + C_p)$ (Answer 8, ¶3). The Examiner further agrees that “it is clear that if the large capacitor C_{HC} is much larger than the parasitic capacitor C_p then the coupling ratio CR will [approach] 1.” (*Id.*) Nevertheless, the Examiner finds the original Specification (including the claims) failed to describe the coupling ratio of $CR = C_{HC}/(C_{HC} + C_p)$ as approximately a unity value (1), i.e., where the value of the large capacitor C_{HC} is much larger than the value of parasitic capacitor C_p , such that the coupling ratio CR approaches one (*Id.*).

We begin our analysis by noting that the Court of Appeals for the Federal Circuit has held that “[t]o fulfill the written description requirement, the patent specification must describe an invention in sufficient detail that one skilled in the art can clearly conclude that the inventor invented what is claimed.” *Cordis Corp. v. Medtronic AVE, Inc.*, 339 F.3d 1352, 1364 (Fed.

Cir. 2003) (citations omitted). Our reviewing court has cautioned, however, that “[t]he disclosure as originally filed does not . . . have to provide *in haec verba* support for the claimed subject matter at issue.” *Id.* at 1364.

“Although [the applicant] does not have to describe exactly the subject matter claimed, . . . the description must clearly allow persons of ordinary skill in the art to recognize that [he or she] invented what is claimed.” *In re Gosteli*, 872 F.2d 1008, 1012 (Fed. Cir. 1989) (citations omitted). Put another way, “the applicant must . . . convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession *of the invention*.” *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64 (Fed. Cir. 1991) (emphasis in original). The written description, although it need not include information that is already known and available to the experienced public, must be in sufficient detail to satisfy the statutory requirements, employing “[w]ords, structures, figures, diagrams, formulas, etc., that fully set forth the claimed invention.” *Space Systems/Loral, Inc. v. Lockheed Martin Corp.*, 405 F.3d 985, 987 (Fed. Cir. 2005) (quoting *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572 (Fed. Cir. 1997)). Finally, “[p]recisely how close the original description must come to comply with the description requirement of § 112 must be determined on a case-by-case basis.” *Eiselstein v. Frank*, 52 F.3d 1035, 1039 (Fed. Cir. 1995) (citation omitted).

After carefully considering the evidence before us, we will reverse the Examiner’s rejection of claims 1-42 as failing to comply with the written description requirement for essentially the same reasons argued by Appellant in the Brief. In particular, we note the Examiner has acknowledged that the

coupling ratio is easily derived as $CR = C_{HC}/(C_{HC} + C_P)$ (*See Answer 8, ¶3*). The Examiner has further acknowledged that “it is clear that if the large capacitor C_{HC} is much larger than the parasitic capacitor C_P then the coupling ratio CR will [approach] 1.” (*Id.*). We note that Appellant need not include information in the disclosure that is already known and available to the experienced public. *See Space Systems/Loral, Inc. v. Lockheed Martin Corp.*, 405 F.3d at 987. Therefore, we conclude that Appellant has provided sufficient detail in the Specification to satisfy the statutory requirements and convey with reasonable clarity to those skilled in the art that the inventors were in possession of the invention at the time of filing.

35 U.S.C. § 112, second paragraph

We consider next the Examiner’s rejection of claims 1-42 as being indefinite under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter which Appellant regards as the invention. Specifically, the Examiner concludes that the following claim language is misdescriptive of the disclosure² (Answer 5):

a coupling ratio between a capacitance value of said large capacitor and a capacitance value of a parasitic capacitor coupled between said bias node and a ground reference point is approximately equal to a unity value . . . ”

² Although the terms of a claim may appear to be definite, inconsistency with the specification disclosure or prior art teachings may make an otherwise definite claim take on an unreasonable degree of uncertainty. *In re Cohn*, 438 F.2d 989, 1000-01, 169 USPQ 95, 98 (CCPA 1971) (“No claim may be read apart from and independent of the supporting disclosure on which it is based.”).

(independent claims 1, 12, 23, and 33).

In particular, the Examiner asserts that the coupling ratio, as claimed, is merely determined by dividing the capacitance value of the large capacitor by the smaller capacitance value of the parasitic capacitor. Thus, the Examiner finds the claim language is misdescriptive of the Specification (i.e., indefinite) because it appears to conform to a coupling ratio where $CR = C_{HC}/C_P$ instead of $CR = C_{HC}/(C_{HC} + C_P)$ (Answer 9).

The Appellant disagrees. Appellant rebuts the Examiner's finding with extrinsic evidence³ that shows the coupling ratio is not the ratio of the capacitance values between the very large capacitor and the parasitic capacitor, as argued by the Examiner (*See e.g.*, "Silicon Processing for the VLSI Era," page 625, formula (8 - 3)). As applied to the instant invention, Appellant contends that the coupling ratio represents the AC coupling of the biasing voltage VB11 at the bias node b11 to the lower supply voltage VSS (*See Fig. 2*).⁴ Appellant argues that this is essentially a capacitive voltage divider and where the voltage VB11 at the bias node b11 becomes a function of the coupling ratio (CR) expressed as $CR = C_{HC}/(C_{HC} + C_P)$ (Br. 17-18).

After carefully considering the evidence before us, we conclude that Appellant's claims 1-42 are not misdescriptive of the Specification. In

³ *See* "Silicon Processing for the VLSI Era", Volume II Process Integration, Wolf, Lattice Press, Sunset Beach, CA., 1990, pp: 623-627.

⁴ We note that Appellant refers to "bias node b11" in the Brief (Br. 17-18). We find no "bias node b11" shown in Fig. 2. However, biasing node b11 is described with respect to Fig. 2 in the Specification on page 62, lines 14, 15, and 20. We consider this discrepancy as an apparent typographical error in Fig. 2, i.e., bias node "b1" of Fig. 2 should be labeled as bias node "b11." Appropriate correction should be made during further prosecution.

particular, we find that a broad but reasonable interpretation of the claim language does not preclude a coupling ratio where $CR = C_{HC}/(C_{HC} + C_P)$. Moreover, we find the Examiner's interpretation here (i.e., that the claim requires $CR = C_{HC}/C_P$) is inconsistent with the Examiner's previous admission that the coupling ratio is easily derived as $CR = C_{HC}/(C_{HC} + C_P)$ (*See Answer 8, ¶3*). Therefore, we do not agree with the Examiner that the claims are indefinite. Accordingly, we reverse the Examiner's rejection of claims 1-42 under 35 U.S.C. § 112, second paragraph.

35 U.S.C. § 103

Independent Claim 1

We consider next the Examiner's rejection of independent claim 1 as being unpatentable over AAPA in view of Rapp.

In rejecting claims under 35 U.S.C. § 103, it is incumbent upon the Examiner to establish a factual basis to support the legal conclusion of obviousness. *See In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). In so doing, the Examiner must make the factual determinations set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966). “[T]he examiner bears the initial burden, on review of the prior art or on any other ground, of presenting a *prima facie* case of unpatentability.” *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). Furthermore, “‘there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness’ . . . [H]owever, the analysis need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of

ordinary skill in the art would employ.” *KSR Int’l Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741 (2007) (quoting *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006)). To be nonobvious, an improvement must be “more than the predictable use of prior art elements according to their established functions.” *KSR*, 127 S. Ct. at 1740.

Appellant has the burden on appeal to the Board to demonstrate error in the Examiner’s position. *See In re Kahn*, 441 F.3d at 985-86 (“On appeal to the Board, an applicant can overcome a rejection [under § 103] by showing insufficient evidence of *prima facie* obviousness or by rebutting the *prima facie* case with evidence of secondary indicia of nonobviousness.”) (quoting *In re Rouffet*, 149 F.3d 1350, 1355 (Fed. Cir. 1998)). Therefore, we look to Appellant’s Brief to show error in the proffered *prima facie* case.

Appellant points out that the capacitor in Rapp is connected to a *ground reference point*, and thus does not charge couple the biasing node to the *lower supply voltage* such that *the voltage at the biasing node follows the lower supply voltage* (Br. 19-20). Appellant notes that the circuit of Rapp provides a comparator circuit that compares the voltage value of a programming voltage supply V_{PP} at node A of Fig. 5 against the voltage value of the power supply voltage V_{DD} . Appellant notes that Rapp’s capacitor helps “to hold the voltage constant at the gate of transistor 86” (*See Rapp*, col. 9, ll. 41-42). In particular, Appellant argues that holding the voltage constant at the transistor gate (as taught by Rapp) does not provide the *coupling of the lower supply voltage to the biasing node as required by the claims of the instant invention* (Br. 20). Appellant further contends that the Examiner has failed to provide a sufficient basis to show that the

combination of AAPA with Rapp would have been obvious to one skilled in the art (*Id.*).

The Examiner disagrees. The Examiner contends that Fig. 5 of Rapp shows large capacitor (90) coupled between the bias node (i.e., the gate of transistor 86) and a lower supply voltage of the Fig. 5 circuit, such that when combined with the AAPA circuit (Fig. 1), then the capacitor 90 in Fig. 5 of Rapp will be connected between the bias node (b1, Fig. 1 of AAPA) and the lower supply voltage Vss of input buffer 100 (Figure 1 of AAPA), and thus the capacitor (90) in the combination/modification will charge couple the biasing node b1 to the lower supply voltage Vss (Answer 10).

After carefully considering all of the evidence before us, we cannot affirm the Examiner on this record. We find there is nothing in the record that indicates the recited “lower supply voltage” and “ground reference point” have the same voltage potential (Claim 1). Indeed, as is conventional, “ground” typically refers to a zero-volt reference point in a circuit. Because the instant invention is directed to reducing or eliminating the adverse biasing effects of “ground noise” (i.e., Vss noise), such noise clearly represents *a voltage potential* between a ground reference point and a lower supply voltage (Vss).⁵ In particular, we find the Examiner’s proffered combination of AAPA and Rapp does not show a large capacitor *coupled between a bias node and a lower supply voltage (i.e., that is not ground)*. AAPA has no large capacitor connected between b1 and Vss (Fig. 1). The Examiner looks to Rapp for the missing capacitor. However, Rapp’s

⁵ See Specification, page 62, paragraph 0016: “The ground noise (VSS noise), as described above, is developed between the lower supply voltage VSS and the ground reference voltage.”

transistor 90 (functioning as a capacitor)⁶ is clearly shown in Fig. 5 as being connected between the gate (bias point) of transistor 86 and a *ground reference point*.

Moreover, we find it highly unlikely that transistor 90 (functioning as a capacitor, *see* Rapp, col. 9, ll. 40-41) would reasonably possess the level of capacitance typically associated with a “large capacitor,” as claimed by the instant invention. Indeed, while a parasitic capacitance is associated with a MOSFET device, (as represented by C_p in AAPA, Fig. 1), a first parasitic capacitance (i.e., the parasitic capacitance associated with Rapp’s transistor 90) is not reasonably a “large capacitor” with respect to a second parasitic capacitance (as represented by C_p in AAPA, Fig. 1). For us to affirm the Examiner on this point would require speculation on our part.

Because the Examiner has failed to show each element connected or coupled as recited in the independent claim 1, we need not reach the issue of motivation to reverse the Examiner’s rejection of claim 1 as being unpatentable over the teachings of AAPA in view of Rapp. We find identical language (i.e., “a large capacitor coupled between the bias node and a *lower supply voltage*”) recited in each of independent claims 12 and 23, and equivalent language recited in independent claim 33 (i.e., “a large capacitor between the bias node and the *lower supply voltage*”). Therefore, we reverse the Examiner’s rejection of independent claims 12, 23, and 33 as being unpatentable over the teachings of AAPA in view of Rapp for the same reasons discussed *supra* with respect to independent claim 1. Because

⁶ Rapp discloses at col. 9, lines 39-42: “The source and drain of transistor 90 are connected to ground. *Transistor 90 serves as a capacitor*, helping to hold the voltage constant at the gate of transistor 86 [emphasis added].”

Appeal 2007-1647
Application 10/631,841

we have reversed the Examiner's rejection of each independent claim on appeal, we also reverse the Examiner's rejection of dependent claims 2-11, 13-22, 24-32, and 34-42 as being unpatentable over the teachings of AAPA in view of Rapp.

DECISION

Based on the findings of facts and analysis above, we conclude Appellant has shown by preponderance of the evidence that the Examiner erred in rejecting claims 1-42 under 35 U.S.C. § 112, first and second paragraphs, and also under 35 U.S.C. § 103 for obviousness. Therefore, the decision of the Examiner rejecting claims 1-42 is reversed.

REVERSED

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Appeal 2007-1647
Application 10/631,841